5   power/ground pre-routing. If relative placements are used, rework in order to

try various placement scenarios or in case of floorplan change will be minimal.

When all floorplan matrices are installed within the floorplan, all involved

cells are pre-placed with the fixed status, which is the highest priority. After all

structure placements are installed, the usual place and route procedures are

10   executed. The constraints for the rest of the standard unstructured cells are

input into the place and route tools, and are placed using automated

procedures, such as timing-driven placement. These procedures may make use

of the porosity of the datapath matrices to place the rest of the standard cells.

If favorable to placement criteria, such as timing specification, and if free

15   space is available among structured placement, standard cells can be placed

within datapaths. Then routing can be performed to complete the layout.

The present invention provides several advantages over the prior art. The

approach described above allows the layout designer to address both timing

performance and density. Matrices are not "hard macros"; therefore, they can

20   be any shape that makes sense from a timing point of view. The placer can take

advantage of the free space within matrices for improving density. Overall

timing-driven placement is improved, since the place and route tool always has

a global view of all timing constraints and can optimize the layout of no-fixed

cell placements.

25   Although the Detailed Description of the invention has been directed to

certain exemplary embodiments, various modifications of these embodiments,

as well as alternative embodiments, will be suggested to those skilled in the art.

The invention encompasses any modifications or alternative embodiments that

fall within the scope of the Claims.